



*Cleco Corporation*  
2030 Donahue Ferry Rd  
P. O. Box 5000  
Pineville, LA 71361-5000

May 19, 2011

Mr. Stephen Hoffman  
US Environmental Protection Agency (5304P)  
1200 Pennsylvania Avenue, NW  
Washington, DC 20460

**RE: Response to the March 14, 2011 CDM Assessment Report  
Titled: "Assessment of Dam Safety of Coal Combustion  
Surface Impoundments"  
Brame Energy Center**

Dear Mr. Hoffman:

Our responses to the recommendations in Enclosure 2 of your letter dated April 19, 2011 are included in the attachment.

If you have any questions or need additional information, please contact me at (318) 484-7742.

Sincerely,

A handwritten signature in blue ink, appearing to read "Brent Croom". The signature is fluid and cursive, with the first name "Brent" being more prominent than the last name "Croom".

Brent Croom  
Manager Waste & Water

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**Recommendation:**

4.3 CDM recommends that all trees and brush be cleared from the exterior slopes of all ash pond embankments under the supervision of a Professional Engineer in accordance with the procedures outlined in “FEMA 534 Technical Manual for Dam Owners – Impacts of Plants on Earthen Dams”. CDM further recommends that stumps and all roots greater than 1 inch in diameter be removed. Disturbed areas should then be graded to adjacent contours, using compacted structural fill and reseeded with desirable grass vegetation. CDM also recommends that vegetation be cut on a regular basis to ensure that adequate visual observations can be made during scheduled inspections.

**Response:**

Cleco will clear the trees and brush from the toe of the embankments. This work may require an approved Section 404 permit. We expect the permitting task to take 8 months to obtain the necessary approvals because wetlands mitigation may be necessary. We will need to perform the tree and brush removal work in dry conditions and we expect this task to take approximately 4 months. Therefore, we expect to complete these tasks by June 1, 2012.

**Recommendation:**

4.4 CDM recommends Cleco take the following corrective actions:

- Waterline erosion – Provide protection of the interior slopes of the Fly Ash Pond embankments against wave erosion by placement of a layer of rock riprap over a layer of bedding and a filter material. Other material such as concrete facing, soil-cement, fabriform bags, slush-grouted rocks, steel sheet piling, and articulated concrete blocks can also be used. Extend armoring at least 3 feet below lowest anticipated pool elevation and at least 2 feet above normal pool elevation.
- Erosion rills – Erosion rills were observed on the interior and exterior slopes of the Bottom Ash Pond and Fly Ash Pond. Place and compact structural fill in the rills and grade to adjacent existing contours.
- Surface cracks – Numerous longitudinal cracks were observed in the crest of the Leachate Pond embankment and in the north and east interior slope of the Fly Ash Pond embankment. The cracks, generally located in areas of the slope where the embankment lacked a healthy grass cover, were approximately 1 to 2 inches wide, and extended approximately 15 inches below grade. Large (wider than 1 inch) well-defined longitudinal cracks extending parallel to the crest of the embankment may indicate the early stages of a slide on either the

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interior or exterior slope of the embankment. They can also create problems by allowing runoff to enter the cracks and saturate the embankment which in turn can cause instability of the embankment. CDM recommends an investigation into the cause of the observed cracking to identify remedial measures to treat the cracks if they are deemed a risk to the embankment. Additionally, CDM recommends that the area should be reseeded with desirable grass vegetation.

- Cracked concrete armoring – Replace cracked or missing concrete armoring in the Bottom Ash Pond. Extend armoring at least 3 feet below lowest anticipated pool elevation and at least 2 feet above normal pool elevation.

All repairs should be designed by a professional engineer familiar with earthen dam construction.

#### **Response:**

Cleco will have the above items evaluated by a third party professional engineer and will implement the necessary corrective actions. We expect this evaluation to take 3 months and the corrective actions to take another 3 months. Due to the need to complete this work in dry conditions, we expect to complete the final corrective actions by April 1, 2012 .

#### **Recommendation:**

4.5 CDM recommends in the future a buttress of deposited fly ash be left in place after each removal operation. CDM also recommends survey control and monitoring of contractor activities to help ensure excavation operations do not alter the slope angles needed to meet the required factors of safety with regard to slope stability.

#### **Response:**

Cleco acknowledges that a buttress of deposited fly ash needs to be left in place after each removal operation. We will also ensure that the fly ash removal contractor understands this item. We will continue to monitor this activity. This item has been corrected.

#### **Recommendation:**

4.6 To monitor the nature of the possible seepage conditions, CDM recommends Cleco take the following actions:

- Develop a regular surveillance program to monitor areas of seepage and potential seepage to evaluate the rate, volume, and turbidity of flow emerging from the embankment slopes;
- Develop and execute a geotechnical exploration program that includes

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additional test borings and installation of piezometers and other instrumentation to analyze and regularly monitor embankment seepage and stability; and

- Continue to read groundwater levels in existing groundwater monitoring wells (W-3, W-4, W-18, W-19, and W-21) at a minimum of a semi-annual basis to establish an adequate base of seasonal water level fluctuations for use in stability analyses and to evaluate potential development of unstable embankment conditions and changes that may be indicative of seepage.

**Response:**

Cleco will develop a seepage monitoring work plan which will evaluate the geotechnical exploration program to monitor embankment seepage and stability. This plan may include installation of additional piezometers if necessary. Information obtained from the stability analysis (see recommendation 4.9) will be utilized to formulate this plan. Therefore this work plan will be develop by October 1, 2011.

**Recommendation:**

4.7 Evidence of rodent burrows and wild boar rooting was observed on the north embankment exterior slopes of the Bottom Ash Pond and Fly Ash Pond. Although not observed on other embankments, vegetation cover may have hidden additional animal activity. CDM recommends Cleco accurately document burrows and other areas disturbed by animal activity, remove the animals, and backfill the burrows and holes with compacted structural fill to protect the integrity of the embankments.

**Response:**

This is an on-going maintenance activity. Cleco will continue the practice of removing animals. We will document and make necessary repairs of the animal activities.

**Recommendation:**

4.8 CDM recommends the installation of staff gauges to all outlet structures to monitor the water levels in all active impoundments and routinely monitoring water levels in the monitoring wells as recommended in Section 4.5 of this report.

**Response:**

Cleco will implement a system to monitor the water levels in the impoundments. This will be in place by August 1, 2011.

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**Recommendation:**

4.9 It is recommended that detailed stability analyses be performed for these embankments utilizing the results of the subsurface program noted Section 4.5 above. The geotechnical investigation should also evaluate the existing soil conditions and engineering characteristics in the embankments and their supporting foundation soils. Stability analyses should consider all appropriate operating and loading conditions including flood conditions, rapid drawdown if applicable, and a seismic stability and liquefaction potential analysis of the upstream and downstream embankment slopes and foundation. CDM recommends that all analyses be performed by a registered professional engineer experienced in earthen dam design.

**Response:**

Cleco will utilize a third party registered professional engineer to perform this task. We expect this task to be complete by October 1, 2011.

**Recommendation: (Note – this item was not included in Enclosure 2 of the letter dated April 19, 2011)**

4.9 A preliminary evaluation performed by CDM suggest there is enough storage capacity at the current operating pool levels to safely store 100% of the PMP event (31.5 inches) in the Fly Ash Pond and Leachate Pond, and 50% of the PMP event (15.8 inches) in the Bottom Ash Pond. CDM recommends Cleco perform a complete study to confirm this opinion and update the study if operating parameters of the ponds change in the future.

**Response:**

The storage capacities were confirmed to be adequate by an outside engineering consultant. This item is complete.

**Recommendation:**

4.10 CDM also recommends that Cleco develop more-detailed inspection documentation procedures that include a sketch of relevant features observed, and the documentation should be periodically reviewed to identify if conditions are worsening and/or if significant changes are occurring that could lead to additional maintenance issues or safety concerns. Inspections should be made following heavy rainfall and/or high water events on Lake Rodemacher and the Red River, and the occurrence of these events should be documented. It is recommended that inspection records be retained at the facility for a minimum of three years.

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**Response:**

A more detailed inspection procedure is currently in place.

**Recommendation:**

4.11 CDM recommends that Cleco review their current facility response plan as it relates to the Bottom Ash Pond, Fly Ash Pond, and Leachate Pond for compliance and consistency with the Louisiana EPP Regulatory requirements. CDM also recommends that Cleco update and revise the current facility response plan as necessary.

**Response:**

Cleco will continue to review and revise the facility response plan as necessary.